Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

nucleus, or only in the nucleolus. Whether this was owing to actual chemical differences, or to the particular condition of excitation at the moment of death of the ganglion, could not be made out. This last suggestion is a very interesting one, and invites to further investigation. In regard to one important point, we cannot help thinking that the author is very obscure. He decides against any possibility of a specific energy in the separate visual elements from the fact, as we understand him,—there are, unfortunately, no plates—that a single cell of the inner nuclear layer is connected with several cells of the ganglionic layer. In the first place, this connection would seem to be a physical impossibility, from the fact that the number of cells in the inner nuclear layer is much greater than in the ganglionic layer. In the second place, absolutely nothing is said about the multiplicity of the connection between the inner and the outer nuclear layer. In the third place, is it quite certain that several different fibres may not preserve their continuity on going through a single ganglionic cell? C. L. F.

On the morphology of the compound eyes of Arthropods. S. WATASE. Studies from the Biological Laboratory, Johns Hopkins University, Baltimore. Vol. iv, No. 6, 1889. Plates XXIX—XXXV.

The author has made both a careful and extensive study of his subject. The paper opens with "a consideration of the *ommatidium* as the morphological unit of the compound eye in arthropods, just as each little circle of rods with a cone in its centre may be considered as the morphological unit of the 'mosaic layer' (Henle) of the human retina." The *ommatidium* in *Serolis*, which is first described, presents three strata of cells. The most superficial is designated *corneagen*, the next the *vitrella*, and the deepest the *retinula*. This last alone is sensory. Each of these cells secretes chitin or a chitinous substance on what is morphologically its outer surface. The cells are, therefore, homologous with the ectodermal cells covering the surface of the body, and the *ommatidium*, with its various specializations, is morphologically a pit in the ectoderm. With *Serolis* as a type, the *ommatidia* of *Talorchestia*, *Combarus*, *Homarus* and *Calinectes*, and a number of others, are found to agree in all essentials. The compound eye of *Limulus* is next described, and the very primitive conditions found in this ancient form are in harmony with the previous observations. The pits in *Limulus* are much less complete than in the other forms described, and the dioptric apparatus less perfect. In discussing the compounding of an eye from these *ommatidia*, the anatomical point is made that the nervous prolongations of the *retinulæ* first form an intricate plexus, and then take their course to the optic ganglia. From the physiological side, it is pointed out that all vision is punctate, whether it be the vertebrate or invertebrate eye which is the organ; and therefore, in considering the vision of a given arthropod, its fineness is measured to some extent by the size of the individual *ommatidia*, whereas the range depends on the number of these units, and the manner in which they are distributed, exposure of *ommatidia* over a spherical surface giving an eye with the widest range. In an appendix, it is stated that the eye-spots in *Asteridæ* agree in their essential structure with those of the arthropods. The paper contains much more of interest, which is, however, not in place here, but which helps to make it a most valuable contribution to our knowledge of the sense-organs.

On the descending degenerations which follow the lesions of the Gyrus marginalis and the Gyrus fornicatus in Monkeys. E. P. FRANCE. With an introduction by Professor Schäfer, F. R. S. Phil. Trans., vol. 180, (1889) B. pp. 331-354. 3 plates.

The brains used in this investigation were from animals that had been employed for physiological experiments by Prof. Schäfer, in conjunction

with Prof. V. Horsley and Dr. Sanger Brown, so that a complete record of the symptoms during life was available. Removal of the *gyrus marginalis* has been found to produce paralysis of the trunk muscles and most of the leg muscles on the side opposite to the lesion. France had at his disposal six cases of lesion to the *gyrus marginalis*. In two the injury was strictly confined to this gyrus, while in the remaining four there was some injury to the adjacent external surface of the hemispheres, or to the *gyrus fornicatus*. A summary of these shows the degeneration as difficult to detect in the internal capsule—all that can be said is, that it has not been observed, frontad of the knee of the internal capsule. At the level of the pons, the degeneration was scattered through the pyramidal bundles. In cases where the lesion had been extensive and the animal had lived for some time, the mass of fibres on the side of the operation was plainly less than on the other side. At the level of the *medulla oblongata*, the degeneration appears in the pyramids, and is more condensed than in the pons. The pyramid on the operated side is smaller at this level also—under the same conditions which determined a difference in size in the pons. In the spinal cord, the degeneration is mainly in the crossed pyramidal tract of the side opposite that of the lesion, and to a much less extent in the crossed pyramidal tract of the same side. In some cases it may be traced as far as the lower lumbar region. Degeneration of the direct pyramidal tract has not been observed on either side. Throughout the cord, the degeneration is most evident in the dorsal and lateral portions of the pyramidal tract, and this location appears characteristic for the lesion which it follows.

In the study of those degenerations, consequent on lesions of the *gyrus fornicatus*, six brains were examined, from which a part or the whole of this *gyrus* had been removed. During life it was found that stimulation of the *gyrus fornicatus* produced no muscular contractions, and that when it was excised, the slight paralysis which sometimes appeared was no more than could be accounted for by the almost unavoidable injury to the *gyrus marginalis* lying above it. On the other hand, its removal caused a well-marked deficiency of general and tactile sensibility over the opposite half of the body. For this lesion, the course of degeneration in the internal capsule could not be made out with any certainty. In the mid-brain, pons and medulla, the degeneration appears like that following marginal lesions, and is found only in the pyramidal bundles on the same side as the lesion. In the spinal cord, the degeneration occupies the whole sectional area of the crossed pyramidal tract, mainly on the side opposite to the lesion, but in part on the same side It may be traced caudad to the level of the fifth lumbar nerve.

In an appendix appears a study of the degenerations which follow the removal of the external motor cortex and of the whole motor cortex of one hemisphere in monkeys, as compared with those which follow lesions of the *gyrus marginalis* alone. In three cases of the removal of the external motor surface of the brain, the animal having lived for some time subsequent to the operation, the resulting degenerations were similar to one another. In the internal capsule the degeneration is well marked. It occupies the middle third of the capsule, and therefore includes the knee, but is confined to the layer of fibres adjacent to the lenticular nucleus, leaving a thin layer which is normal, towards the thalamus. At the other levels it is as follows: *Crusta*: Degeneration clearly defined; occupies middle third, the dorsal part being less completely degenerated than the ventral. *Pons:* Degeneration involves the entire pyramid, on the same side, almost all the fibers being degenerated. *Medulla:* Whole pyramid of the same side is degenerated, except a narrow portion of the dorsal and mesal tract which is less affected. *Spinal cord:* The degeneration is in the crossed pyramidal tract, the portion bordering on the direct cerebellar tract being less affected. It may be followed to the lower lumbar region. In four cases, the *entire*

motor area was removed from one hemisphere. The entire motor surface comprises the region just described in the previous cases, plus the *gyrus marginalis*. The degenerations observed were quite similar to those described as following the removal of the external motor area, except that they were more complete. In the internal capsule, the degeneration includes the layer adjacent to the optic thalamus. In the crusta and pons it was more complete. In the medulla the pyramid was entirely degenerated, and in the spinal cord the entire crossed pyramidal tract was degenerated, the part bordering on the direct cerebellar tract as completely as the rest. The degeneration passes to the level of the fourth lumbar nerve. So far as these results bear on the *gyrus marginalis*, they show the plus of degeneration in this last group to be equivalent to the entire degeneration where this gyrus alone is destroyed, the two sets of observations thus harmonizing in a satisfactory manner. No definite statement is made in the appendix concerning the side of the cord in which the degeneration of the crossed pyramidal tract occurs. It is to be presumed, however, that the bulk of degeneration is on the side opposite to that of the lesion, while to some extent it occurs on the same side. No degeneration has ever been observed in the anterior columns of the cord in the monkey, and from this the author concludes that the decussation at the pyramids is complete. Since, however, the degeneration occurs in both crossed pyramidal tracts, it would seem to indicate that though no pyramidal fibers found their way to the anterior columns, yet the crossing was incomplete. Aside from the interesting point that the dorsal and lateral portion of the crossed pyramidal tract contains the bulk of the fibers from the *gyrus marginalis*; that these same have a distinct path through the internal capsule and other portions of the axis; and that there is no degeneration in the anterior columns of the spinal cord, there is the very striking result that the *gyrus fornicatus*, which is not connected with motion, but is connected with sensation, causes, on its removal, a descending degeneration, and that this degeneration follows the path of the crossed pyramidal tracts. As Schäfer points out, it is very difficult to bring this degeneration with such a direction and track into harmony with the current views of the relation of the nerve fiber to the cell, and the direction in which degeneration of sensory fibers takes place. The solution of the contradiction is left for further investigation.

(In the rabbit, at least, and probably in man, the cerebral cortex is represented in the thalamus, a portion of the thalamus degenerating in correspondence with the part of the cortex removed, e. g. primary optic centers. This gives the motor cortex at least a double connection with the lower centres, and though these fibers degenerate from above downwards, there is much reason to consider them as sensory, and the results obtained by France from the study of the *gyrus fornicatus* serves to increase the probability of such a view. REV.)

On Neurokeratin. W KÜHNE and R. H. CHITTENDEN. New York Medical Journal, Feb. 22 and Mar. 1, 1890.

In the first paper, Neurokeratin is defined as the constituent of the peripheral and central nervous systems, which is insoluble in alcohol, ether, gastric and pancreatic juice, and dilute caustic potash. The substance was first described by Kühne some thirteen years ago, and since that time has been much discussed by histologists, its existence being doubted by some, while certain parts of the nerve fiber were by others identified with it, one argument against it being that it was an artefact developed by the action of the alcohol and ether. That objection seems now to be answered by the fact that it can be equally well obtained, whether the specimen be first treated with alcohol and ether